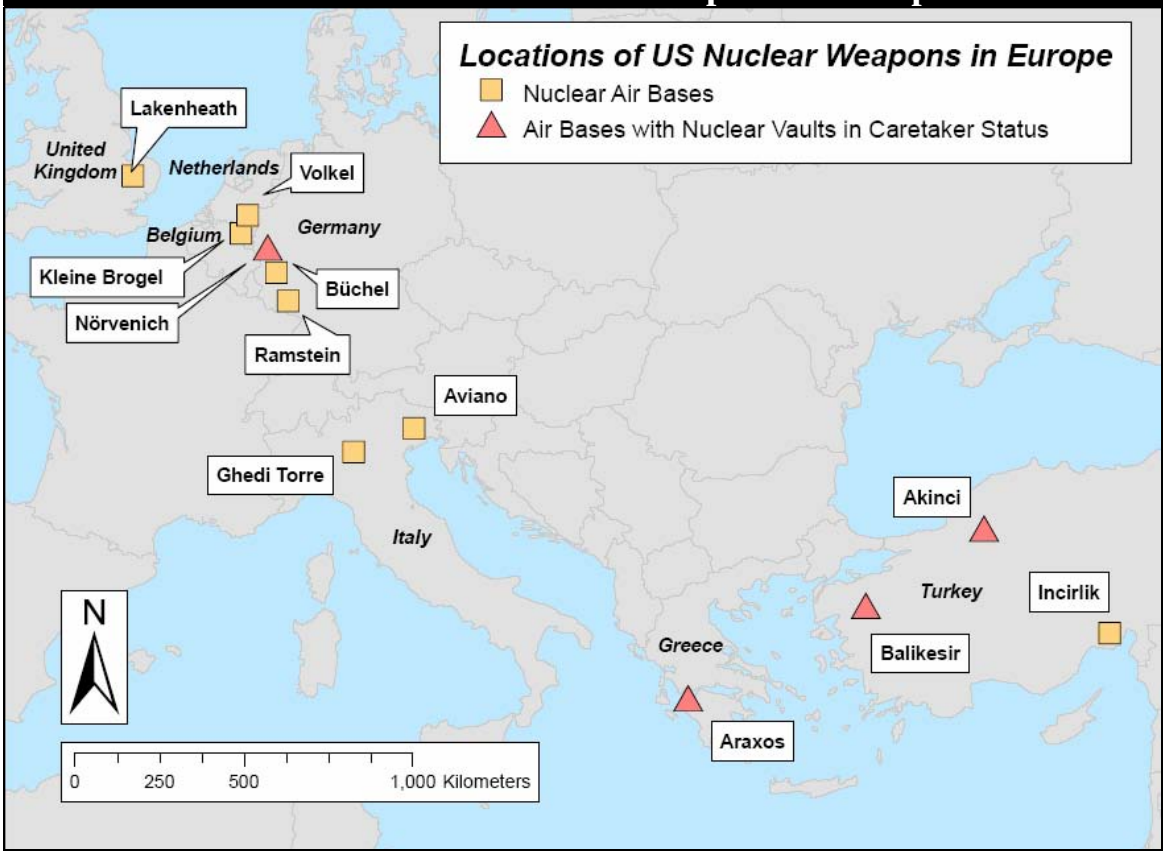
LARGE U.S. NUCLEAR FORCE REMAINS IN EUROPE

The United States currently deploys approximately 480 nuclear weapons in Europe. The weapons are stored at eight bases in six countries, mainly located in northeastern Europe. At four other bases, mostly in the eastern Mediterranean region, the nuclear weapons have been removed but could be redeployed if necessary (see Figure 1).

Figure 1:
Locations of U.S. Nuclear Weapons in Europe



All the weapons are gravity bombs of the B61-3, -4, and -10 types.[2] Germany remains the most heavily nuclearized country with three nuclear bases (two of which are fully operational) and may store as many as 150 bombs (depending on the status of the weapons removed from the German Air Base at Memmingen and Araxos Air Base in Greece). Royal Air Force (RAF) Lakenheath stores 110 weapons, a considerable number in this region given the demise of the Soviet Union. Italy and Turkey each host 90 bombs, while 20 bombs are stored in Belgium and in the Netherlands (see Table 1).

The current force level is two-three times greater than the estimates made by nongovernmental analysts during the second half of the 1990s. Those estimates were based on private and public statements by a number of government sources and assumptions about the weapon storage capacity at each base. Although some of those

sources correctly identified 480 U.S. weapons in Europe by 1994, reductions rumored to have taken place in the second half of the 1990s in fact never happened.

Table 1:
U.S. Nuclear Weapons in Europe, 2005*

Country	Base	Weapons (B61)		
		US	Host	Total
Belgium	Kleine Brogel AB	0	20	20
Germany	Büchel AB	0	20	20
	Nörvenich AB	0	0	0
	Ramstein AB	90	40	130
Italy	Aviano AB	50	0	50
	Ghedi Torre AB	0	40	40
Netherlands	Volkel AB	0	20	20
Turkey	Akinci AB	0	0	0
	Balikesir AB	0	0	0
	Incirlik AB	50	40	90
United Kingdom	RAF Lakenheath	110	0	110
Total		**300**	**180**	**480**

* See Appendix A for more details and background.

The actual force level – greater in size than the entire Chinese nuclear stockpile – was continued from the force level set by the Clinton administration in 1994 and 2000. One of President Clinton's last acts as president was to sign Presidential Decision Directive/NSC-74 in November 2000, which authorized the U.S. Department of Defense to deploy 480 nuclear bombs in Europe. The new directive replaced a previous deployment directive from October 1997 that covered the years 1998 and 1999. The Bush administration is not thought to have changed the force level.

Table 2:
B61 Nuclear Bomb Characteristics[3]

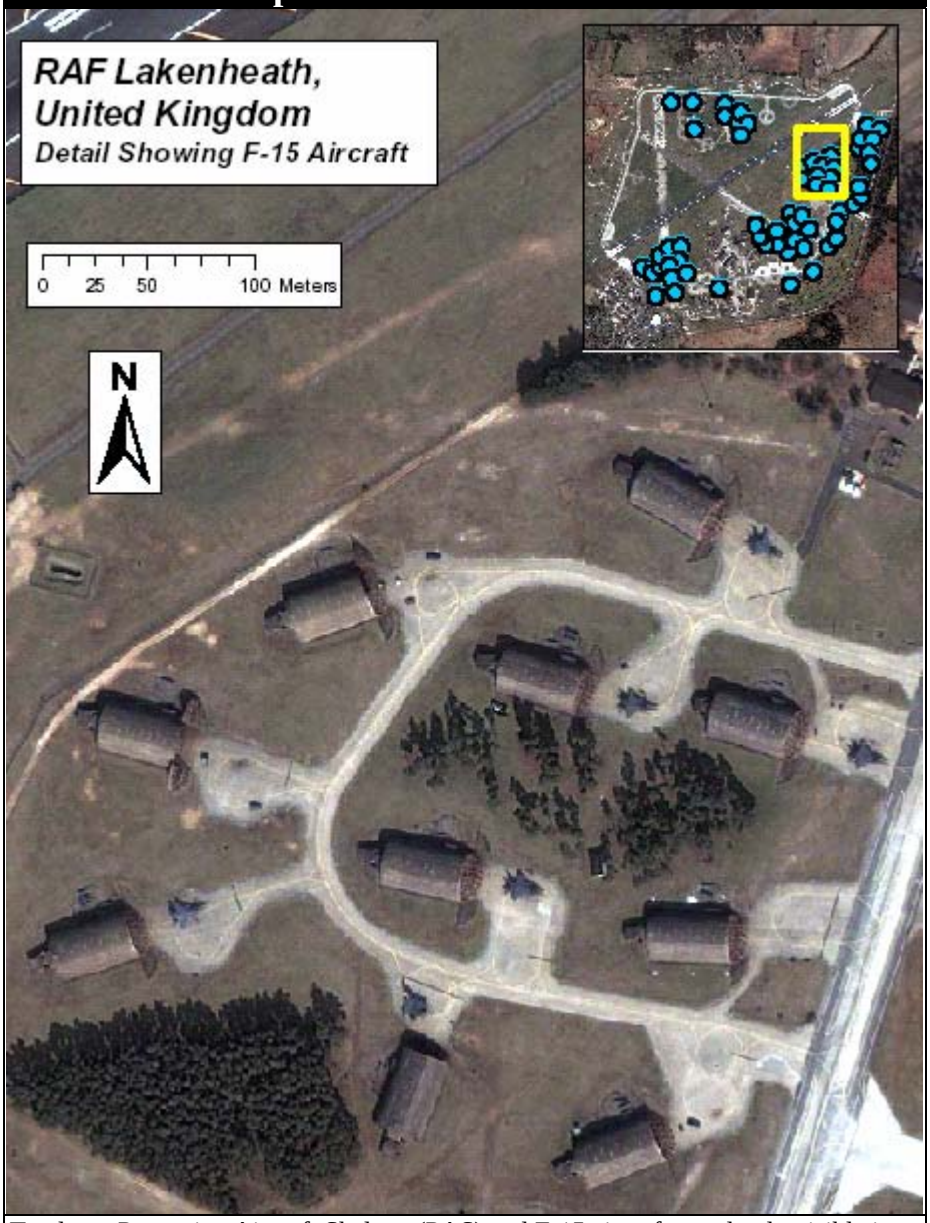
Weapon	Yield	Years Build	Total U.S. Stockpile		
			Active	Reserve/ Inactive	Total
B61-3	.3, 1.5, 60, or 170 kilotons	1979-1989	200	196	396
B61-4	.3, 1.5, 10, or 45 kilotons	1979-1989	200	212	412
B61-10*	.3, 5, 10, or 80 kilotons	1990-1991	180	28	208
Total			**580**	**436**	**1,016**

* The B61-10 is a converted Pershing II missile W85 warhead.

The forward-deployed weapons probably include all three versions of the tactical B61 bomb (B61-3, B61-4, and B61-10). The B61-3 and -4 versions were built between 1979

and 1989, while the B61-10 is a converted Pershing II warhead. All three types have four selective yields down to 0.3 kilotons (300 tons), the lowest known yield of any U.S. nuclear weapon. Their maximum yields vary from 45 kilotons (B61-4) to as much as 170 kilotons (B61-3). (See Table 2)

Figure 2:
Close-Up of Protective Aircraft Shelters



Ten large Protective Aircraft Shelters (PAS) and F-15 aircraft are clearly visible in this satellite image of RAF Lakenheath in the United Kingdom. Also visible are various service vehicles in front of the shelters, three of which have open front doors. There are 60 PAS at the base (see Appendix C), 33 of which currently store a total of 110 U.S. B61 nuclear bombs. *Source: DigitalGlobe.*

The 480 bombs deployed in Europe represent more than 80 percent of all the active B61 tactical bombs in the U.S. stockpile. No other U.S. nuclear weapons are forward-deployed (other than warheads on ballistic missile submarines). An additional 436 bombs are in reserve or inactive status but could be returned to the active stockpile quickly if necessary.

Approximately 300 of the 480 bombs are assigned for delivery by U.S. F-15E and F-16C/D aircraft (capable of carrying up to five and two B61 bombs each, respectively) deployed in Europe or rotating through the U.S. bases. The remaining 180 bombs are earmarked for delivery by the air forces of five NATO countries, including Belgian, Dutch, and Turkish F-16s and German and Italian PA-200 Tornado aircraft (up to two weapons each).

Control of the nuclear weapons at national air bases is performed by the U.S. Munitions Support Squadron (MUNSS) at each base (see Table 3). Each MUNSS includes approximately 110 personnel that are responsible for the physical security of the weapons, maintenance and logistics of the weapons and the Weapons Storage and Security System (WS3), and handing over the nuclear bombs to the national air forces if ordered to do so by the U.S. National Command Authority. Prior to assignment to a MUNSS, officers undergo a two-day route orientation at Spangdahlem Air Base.[4] All MUNSS units fall under the command of the 38th Munitions Maintenance Group (MMG) at Spangdahlem Air Base. The group was stood up on May 27, 2004.[5]

Table 3:
Munitions Support Squadrons At National Air Bases

Base	Designation*	Status
Araxos AB, Greece		731 MUNSS withdrawn in 2001
Akinci AB, Turkey		739 MUNSS withdrawn in 1996
Balikesir AB, Turkey		39 MUNSS withdrawn in 1996
Büchel AB, Germany	702 MUNSS	Previously 852 MUNSS
Ghedi Torre AB, Italy	704 MUNSS	Previously 831 MUNSS
Kleine Brogel AB, Belgium	701 MUNSS	Previously 52 MUNSS
Nörvenich AB, Germany		604 MUNSS withdrawn in 1996
Volkel AB, the Netherlands	703 MUNSS	Previously 752 MUNSS

* New three-digit designations were assigned in 2004. All MUNSS units are organized under the 38th Munitions Maintenance Group (MMG) at Spangdahlem AB.

The breakdown of the weapons deployment reveals some interesting characteristics of the distribution of the weapons. The greatest number of weapons (300, or more than 62 percent) are stored on bases in northern Europe. More than 83 percent (110 of 132 spaces) of the vaults at RAF Lakenheath still store nuclear weapons. This "northern focus" is noteworthy given the considerable changes in the former Soviet Union. The 180 weapons on southern bases are fewer but much closer to the "new threat" of the proliferating countries in the Middle East region, a security problem that NATO is currently focused on.

Another interesting feature is that nuclear weapons that were withdrawn from two German bases, two Turkish bases, and one Italian base in the mid 1990s were not returned to the United States but transferred to the main U.S. base in those countries. In Germany, the weapons were moved from Memmingen Air Base and Nörvenich Air Base to Ramstein Air Base. In Turkey, they were moved from Akinci Air Base and Balikesir Air Base to Incirlik Air Base, and in Italy, the weapons were moved from Rimini Air Base to Ghedi Torre Air Base. These transfers appear to have been a consistent pattern: Nuclear weapons were not withdrawn from the European theater when a U.S. Munitions Support Squadron (MUNSS) was inactivated at national bases, but instead were moved to the main U.S. operating base in each country. In all of these cases, the weapons continue to be earmarked for "host nation use" and delivery by the national air forces.

In the case of Ghedi Torre Air Base, the situation is particularly noteworthy because the base's utilized weapons storage capacity is nearly double that of the other national bases. Out of a maximum capacity of 44 weapon spaces in 11 vaults at Ghedi Torre, roughly 40 (more than 90 percent) are filled. It is the only known case in Europe where a national air base stores more than 20 nuclear weapons. Half of the weapons at Ghedi Torre were previously stored at Rimini Air Base, which ended nuclear operations in 1993. It is unclear whether this means that the 6th Stormo Wing at Ghedi Torre has a particularly large nuclear strike mission, or that another Italian wing also has a nuclear role.

The deployment of U.S. nuclear weapons on the territories of European countries is arranged by a series of secret nuclear agreements between the United States and each host or user country. The nuclear agreements fall into four categories:[6]

> The Atomic Stockpile Agreement is a bilateral agreement between the United States government and a user nation. It guides introduction and storage within a country, custody, security, safety and release of weapons, as well as cost sharing.
>
> The Atomic Cooperation Agreement is a bilateral agreement between the United States and a user nation that provides for the "Exchange of Atomic information useful for mutual Defense Purposes."
>
> The Service-Level Agreement is a bilateral technical agreement between the military services of the United States and the user nation. It implements the government-to-government stockpile agreement and provides details for the nuclear deployment and use and defines joint and individual responsibilities.
>
> "Third party" stockpile agreements are government-level agreements between the United States, third nation and user nation. It guides stockpiling of nuclear weapons within the territory of a third-nation for the use by NATO committed forces of a signatory user nation.

Between 1952 and 1968, a total of 68 individual nuclear agreements were signed between the United States and nine NATO countries. By 1978, 53 of those agreements remained

in effect, including nine service-to-service technical agreements governing the deployment of U.S. Air Force nuclear bombs in as many countries (Belgium, Canada, Germany, Greece, Italy, Netherlands, Turkey and the United Kingdom).[7] Canada left NATO's surrogate nuclear club in 1984, apparently followed by Greece in 2001. As a result, nuclear agreements today are in effect with six NATO countries: Belgium, Germany, Italy, Netherlands, Turkey, and United Kingdom. The code words for some of the technical agreements (Service-Level Agreements) for the NATO countries that currently store U.S. nuclear weapons are known: Pine Cone for Belgium; Toolchest for Germany; Stone Ax for Italy; and Toy Chest for the Netherlands.[8]

Underground Nuclear Weapons Storage Logistics

The B61 nuclear bombs in Europe are stored in what is known as the Weapon Storage and Security System (WS3), a nuclear weapons storage capability unique to the European theater. This system enables the weapons to be stored underground in Weapons Storage Vaults (WSV) inside the individual Protective Aircraft Shelters (PAS)[9] on each base rather than in igloos in a centralized Weapons Storage Area (WSA). There are currently 204 WSVs in Europe, with a total capacity of 816 weapons (see Table 4).

Table 4:
Weapon Storage and Security System (WS3)

Country	Base	WSV	Max. Capacity
Belgium	Kleine Brogel AB	11	44
Germany[a]	Büchel AB	11	44
	Nörvenich AB[b]	11	44
	Ramstein AB	55[c]	220
Greece	Araxos AB[b]	6	24
Italy	Aviano AB	18	72
	Ghedi Torre AB	11	44
Netherlands	Volkel AB	11	44
Turkey	Akinci AB[b]	6	24
	Balikesir AB[b]	6	24
	Incirlik AB	25	100
United Kingdom	RAF Lakenheath	33	132
Total		**204**	**816**

[a] The German air base at Memmingen was closed in 2003.
[b] The vaults at these bases are in caretaker status with no weapons.
[c] One of these is thought to be a training vault.

Until now most independent analysts have assumed that each vault could store up to two weapons. But declassified documents disclose, as do careful analysis of photographs of the vaults published by the U.S. Air Force and Sandia National Laboratories (SNL) (reproduced below), that each vault can store up to four weapons. In reality, however, most bases utilize only part of their maximum capacity. The one exception is Ghedi

Torre Air Base in Italy, which stores 40 weapons in 11 vaults with only four spares (see Appendix A).

The WS3 program started in 1976 when SNL began a "forward look" study to determine how to better safeguard nuclear weapons deployed in overseas locations. At that time, nuclear weapons were stored in igloos in a double-fenced WSA at the base. In 1979, the effort produced a capability study on how to disperse the weapons for storage in the hangars themselves. Full-scale development of the four-weapon vault system began in September 1983, and Research, Development, Test, and Evaluation (RDT&E) was carried out at Ramstein Air Base in November and December 1987. The program entered production and deployment phase in August 1988 with a contract awarded to Bechtel International Inc. The first location to achieve Initial Operational Capability (IOC) was Büchel Air Base in September 1990. Incirlik Air Base was the last, in April 1998. Originally, 249 vaults were built at 15 sites in seven countries (see Appendix B).[10] The WS3 system is made up of five functional areas:

- Weapon Storage Vault (WSV)
- Communications, Command, and Control (C3)
- Assessment
- Code Transfer and Storage
- Voice Communication

The WSV, the mechanical portion of the WS3, is a reinforced concrete foundation and a steel structure recessed into the floor of Protective Aircraft Shelters (PAS). The vault barrier, barrier support, midlevel deck, and platform assembly are designed to be elevated out of the concrete foundation by means of an elevator drive system to provide access to the weapons in two stages or levels, or to be lowered into the floor to provide protection and security for the weapons. The floor slab is approximately 16 inches thick. Sensors to detect intrusion attempts are imbedded in the concrete vault body. A fully configured WSV will store up to four nuclear weapons (see Figures 3 and Figure 4).[11]

The WS3 was originally envisioned to be a global system deployed at U.S. Air Force bases where the U.S. deployed nuclear weapons overseas. A total of 437 vaults with a maximum capacity of more than 1,700 weapons were initially planned for 28 locations worldwide (36 vaults were planned for Kunsan Air Base in South Korea). Of these, 401 were in Europe with a combined capacity of 1,604 weapons. The scope of the program was scaled back considerably, as were the number of WSVs at each base. In 1997, there were 249 sites with a capacity of 996 weapons (even though only approximately 520 U.S. and U.K. weapons were present) in Europe. Today, there are 204 vaults with a maximum capacity of 816 weapons – nearly double the number of weapons actually deployed (see Appendix A and Appendix B).

Figure 3:
Elevated Weapon Storage Vault in Hangar

Elevated Weapons Storage Vault (WSV) with B61 body in Protective Aircraft Hangar with F-16 in the background. Notice the offset twin hangars in the ceiling of the top rack enabling storage of two offset weapons on each level for a total of four weapons in the vault. *Source: U.S. Air Force.*

Initially, a small number of vaults at six bases in four countries were planned to store W84 warheads for the Ground Launched Cruise Missile. The 1987 INF Treaty removed this requirement. Araxos Air Base in Greece was initially planned to have 11 vaults, but in July 1996 the Pentagon awarded a contract for construction of only six vaults, the same number as Akinci Air Base and Balikesir Air Base in Turkey.[12] The WS3 system was also used to store Royal Air Force WE177 bombs at the RAF Brüggen in Germany between 1995 and 1998, after which the United Kingdom scrapped its aircraft-delivered nuclear weapons.

Since 1993, the WS3 sites at several bases have been inactivated as the nuclear weapons were moved to Major Operating Bases (MOB). This includes Memmingen Air Base, Nörvenich Air Base, and RAF Brüggen in Germany, Akinci Air Base and Balikesir Air Base in Turkey, Araxos Air Base in Greece, RAF Marham in the United Kingdom, and Rimini Air Base in Italy. Four of these bases (RAF Brüggen, RAF Marham, Memmingen Air Base, and Rimini Air Base) have since closed and the WS3 dismantled. At the remaining four inactivated sites, the WS3s are in "caretaker status" and have been "mothballed in such a way that if we chose to go back into those bases we can do it," according to Harold Smith, the former U.S. Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs.[13]

Figure 4:
Weapon Storage Vault Loading Demonstration

Loading demonstration of two B61 bomb shapes into the top bay of a Weapons Storage Vault (WSV) at Sandia National Laboratories. Notice the tailfins of the two bombs hanging in opposite directions, enabling storage of two weapons in each bay.
Source: Sandia National Laboratories.[14]

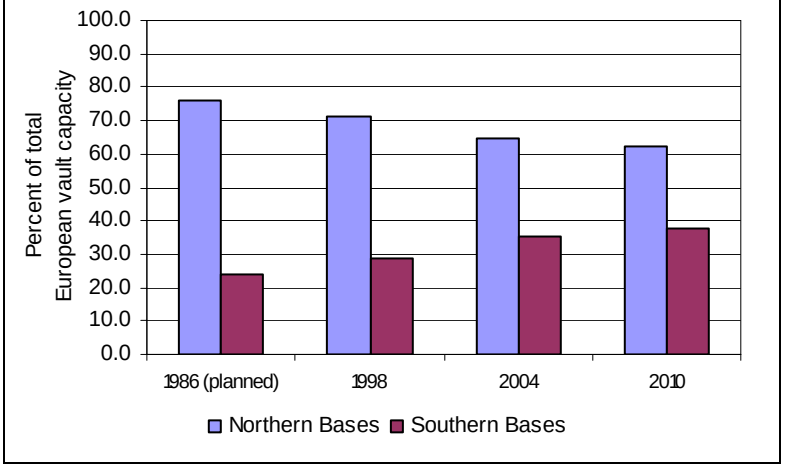
Over time, due to the cancellation and closure of some sites, the geographical distribution of the WS3 system in Europe has changed from a predominantly northern European one to a system where the sites in the southern region represent a gradually increasing share of the total system. Even today, however, a decade and a half after the Soviet Union collapsed, nearly two-thirds of the WS3 capacity is located in northern Europe (see Table 5).

According to the U.S. Air Force, the storage of nuclear weapons inside aircraft hangars is an improved storage process to the previously used method of centralized storage in WSAs. "The concept of decentralized (dispersal) and co-locating the weapon(s) with the aircraft enhances survivability, safety, security, and operational availability while reducing the overall intelligence signature."[15]

Obviously, bringing nuclear weapons into hangars in close proximity with aircraft fuel and conventional munitions raises a whole other set of security issues. Two sizes of shelters have been equipped with the WSV system, a larger PAS measuring 37.5 x 23 meters and a smaller 32.5 x 17 meters shelter. Many of the nuclear bases have a mix of the two types of shelters, but RAF Lakenheath alone has larger shelters. Most national bases only have the small shelters. To ensure separation of nuclear weapons from flammable or explosive materials, the WSV must always be closed under normal

circumstances, and limits have been set on how much explosive material may be present in each PAS and how close to the vault (see Figure 5).

Table 5:
Regional WS3 Capacity

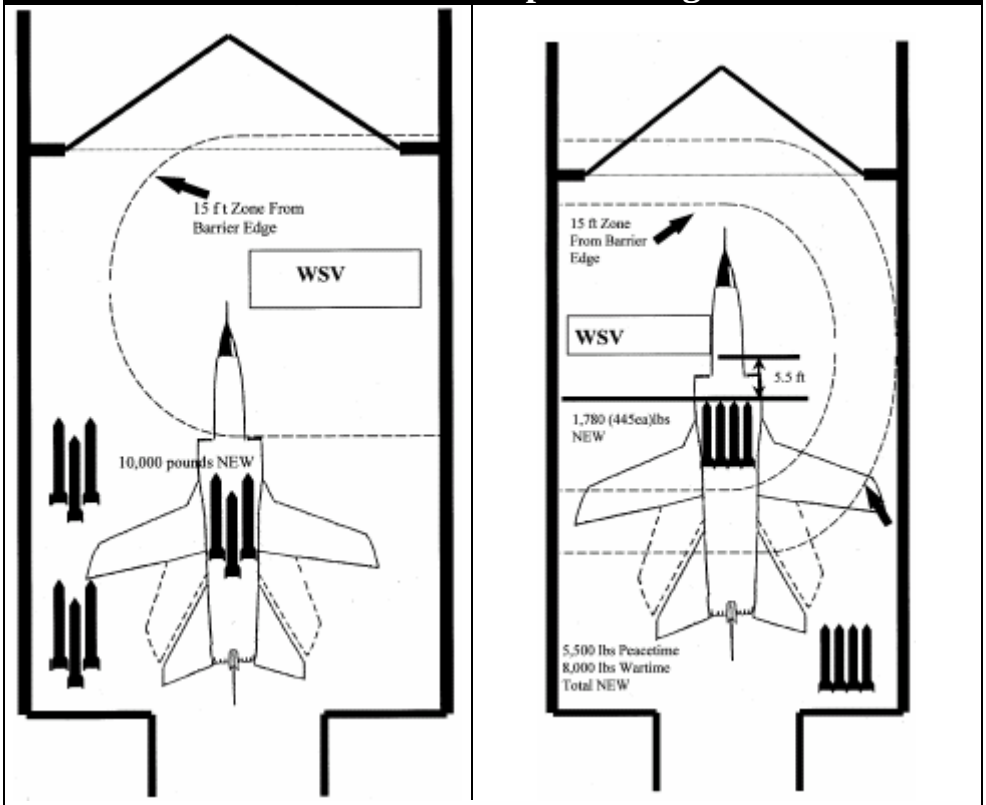


PAS with vaults installed are occasionally inspected under the Treaty on Conventional Armed Forces in Europe (CFE), which entered into force in 1992. But inspectors are granted access only when the nuclear weapons storage vault is down and locked. WS3 control panels are covered and photographs are not to reveal the location of vaults and control panels. If, for any reason, a vault is unlocked or is up during an inspection, the entire PAS will become a nuclear exclusion zone and access will be denied. In this case, U.S. personnel will remove aircraft from the shelter and declare it "a sensitive point."[16]

Support of the WS3 is provided by 14 Weapons Maintenance Trucks (WMT) located at the weapons locations (see Figures 6).[17] The system was initiated in 1991, when U.S. Air Forces in Europe (USAFE) first put into effect its Regionalized Nuclear Weapons Maintenance Concept (RNWMC) at operational units with WS3s. A task team of 21 Air Force Safety Command (AFSC) 2W2X1 (Munitions Systems Specialist, Nuclear Weapons) personnel was established under the 86th Wing's Equipment Maintenance Squadron at Ramstein Air Base to deploy temporarily to selected locations and perform nuclear weapons maintenance inside the WMT parked within a PAS.[18]

Refinements and upgrades of the WS3 system continue today that suggest NATO plans to keep U.S. nuclear weapons in Europe for many years to come. Blast effect studies were completed for the WS3 in 1999 and 2000,[19] and the current modification program seeks to enable WS3 sustainment through FY2018. This program is a two-phase effort stretching through 2005 (see Figure 7).[20]

Figure 5:
Protective Aircraft Shelter Weapon Storage Vault Location



Two Protective Aircraft Shelter (PAS) configurations when conventional munitions are stored in the hangar with nuclear weapons in the underground Weapons Storage Vault (WSV): left – large shelters (37.5x23 meters) that permit 15-foot barrier from the WSV; right – small shelters (31.5x17 meters) that are too small to permit 15-foot barrier.
Source: U.S. Air Force.

The total cost of maintaining nuclear deployments to Europe is not known. But some indicators are found in the funding for building and maintaining the WS3 facilities. The WS3 at Ramstein Air Base was initially projected to cost $800,000 (58 vaults in 1986).[21] The contract for construction and installation of 18 WSVs (six at each base) at Araxos Air Base in Greece and Akinci and Balikesir in Turkey was $11.6 million in 1996,[22] or more than half a million dollars per vault. The U.S. Air Force's cost for operating and maintaining the WS3 in FY1999 was $81,719.[23]

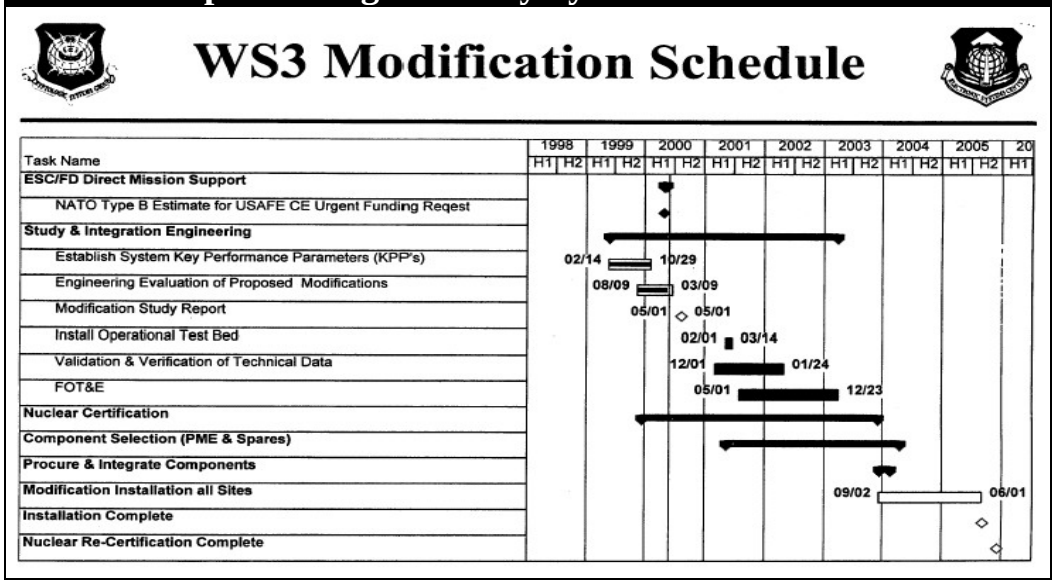
It cost USAFE $680,000 in 1999 to initiate the current modernization effort. One of the challenges discussed within the U.S. Air Force WS3 team was how to persuade NATO to contribute to the funding. Through 2005, the total cost was estimated at $10.2 million.[24] Most recently, in July 2004, the U.S. Air Force awarded a $2 million contract for the upgrade of monitoring and console equipment for WS3 at 12 NATO installations.[25]

Figure 6:
NATO Nuclear Weapons Maintenance Truck[26]

NATO nuclear Weapons Maintenance Truck (WMT) for service of B61 bombs held in Weapons Security Storage System (WS3) vaults in Protective Aircraft Shelters (PAS) at eight bases in six NATO countries. Picture is from Kleine Brogel Air Base in Belgium. Fourteen such trucks exist.

The interior of a WMT used at Kleine Brogel Air Base. Note the grey brace in the foreground used to lock in the bomb during maintenance. A logo for the Jabo G-34 fighter-bomber squadron at Memmingen Air Base in Germany is also visible on the inside of the right-hand side rear door.

Figure 7:
Weapon Storage Security System Modernization[27]



Stockpile Upgrades Made Under Guise of Safety Concerns

Over the past several years, the B61 nuclear weapons deployed in Europe have been modified and equipped with new capabilities. In 2002, the Sandia National Laboratories (SNL) completed alterations on all B61-3, -4, and -10 weapons stored in Europe.[28] The purpose of these alterations was to enhance the reliability, use control, and safety of these retrofitted weapons (see Table 6). According to the Department of Energy, "These alterations upgrade components or refurbish or replace aged components so that weapons will continue to meet Military Characteristics and remain safe and reliable in the environments defined in the Stockpile-to-Target Sequence."[29] The projects involved hundreds of personnel across the SNL complex.

The upgrades included development and deployment of the Code Management System (CMS) (ALT 339), a project first begun in 1995 to improve command and control of nuclear weapons. The codes are used in conjunction with Permissive Action Links (PALs) inside the nuclear weapon to recode, unlock, lock, and manage the weapons, while ensuring the secrecy and authenticity of launch orders. In total, CMS consists of fourteen custom products (nine software and five hardware products). The software was designed at Sandia and contains about 160,000 lines of uncommented computer source code (260,000 including comments). The hardware was manufactured at the National Nuclear Security Administration's Kansas City Plant and fits in a kit the size of a small suitcase.[30]

The weapon upgrades coincided with delivery of new trainers for use by ground crews in weapons practice drills. For the European nuclear bases, a total of 54 Type 3 trainers were required for February 2004 (see Table 7).

Table 6:
Recent Modifications to U.S. Nuclear Weapons in Europe

ALT 335	Carried out between October 1998 and September 2003. Installed a Trajectory Sensing Signal Generator (TSSG), a safety improvement that increases the nuclear safety of the bomb in certain normal and abnormal environments. Büchel AB received initial training in May 1996.
ALT 339	Carried out between October 1998 and September 2003. Installed the MC4519 MCCS Encryption Translator Assembly (MET) in B61-3, -4, and -10 to provide weapons with cryptographic capability to implement end-to-end encryption in the PAL Code Management System (CMS). MC4519 MET coupled with the CMS enables recoding of nuclear weapons in a fully encrypted manner. MET capability improves the positive controls over use of the warhead. Regular monthly shipments started in June 1997. The first CMS became operational on B61s in Europe on November 30, 2001.
ALT 354	Carried out between March 2001 and March 2002. Adjustment of fin cant angle for B61-3, -4, and -10 to improve weapon spin rates when used in conjunction with existing spin motor.

The CMS greatly simplifies use and logistics for personnel and greater flexibility and speed in maintenance and arming of the weapons. The products were delivered on November 7, 2001, but MUNSS units began training for them in 1996 (the 817th MUNSS at Büchel Air Base in March 1996). The CMS first became operational on nuclear bombs in Europe on November 30, 2001. One part of the system, a cryptographic processor, was deployed in Europe in 1997 "to address some Y2K problems." CMS replaced the code management equipment on all U.S. military and National Nuclear Security Administration (NNSA) users by early 2004, and is envisioned to be the common foundation for all future upgrades of U.S. PAL system hardware and software.[31]

Table 7:
Type 3 Trainer Requirements by Location and Type[32]

Base	Type 3A	Type 3E	Total
Aviano B61-4	2	3	5
Büchel B61-4	1	6	7
Ghedi Torre B61-4	1	6	7
Incirlik B61-4	2	1	3
Kleine Brogel B61-4	1	6	7
Lakenheath B61-4	2	7	9
Ramstein B61-0		1	1
Ramstein B61-4	2	4	6
Spangdahlem B61-4	1	1	2
Volkel B61-4	1	6	7
Total	**13**	**41**	**54**

It would be tempting to interpret this Air Force instruction list as a disclosure of which modifications of the B61 bomb are deployed at each base, but that would probably be a mistake for several reasons. First, it would imply that the B61-0 is deployed in Europe, but the last B61-0, a strategic bomb, was dismantled in 1996. Second, it would mean that only the B61-4 (not B61-3 and B61-10) is deployed even though the entire U.S. stockpile of B61-4s consists of only 200 active weapons, less than half of the current stockpile in Europe. Nor does the number of trainers at each base appear to indicate how many weapons are stored at each facility since bases with 20 or 100 weapons have almost the same number of trainers.

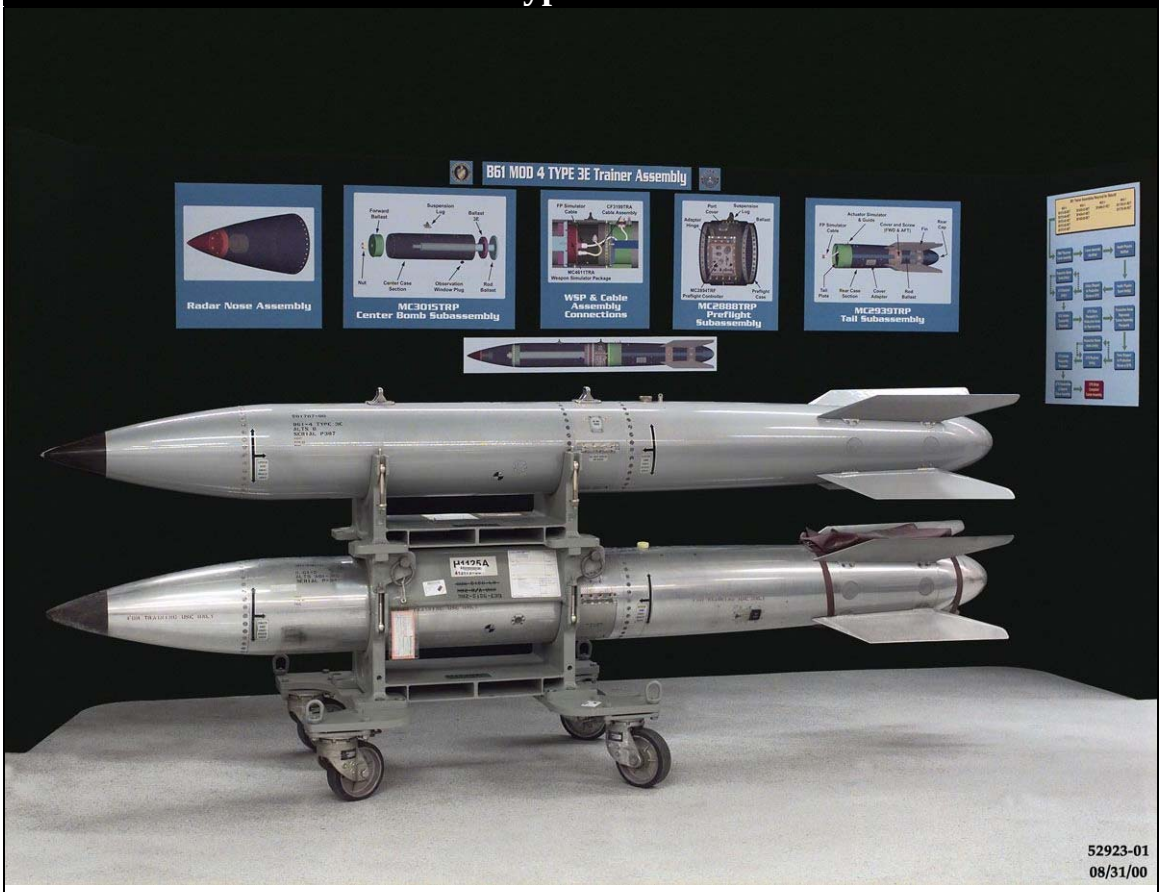
Rather, the number next to the base name appears to be part of the designation of the trainer itself, which can be used for all three bomb types. Trainers used at air bases for handling nuclear weapons until recently were mock-ups of older trainers designed for older versions of the B61 bomb or were U.S. Navy conventional bomb trainers retrofitted to look like B61s. The U.S. Air Force decided in 1997 that the old trainers should be discontinued because weapons loading and handling crews were unable to complete exercises intended to check their ability to safely move, inspect, mount to aircraft, arm, disarm, and return to storage the B61-3, -4, and -10 bombs – modifications of the B61 that are similar in appearance and function.

In March 1998, the U.S. Air Force asked Sandia National Laboratories to design a new trainer that would resemble the B61-3, -4, and -10 nuclear bombs. The result was the B61-4 Type 3E trainer (see Figure 8) of which the first six were delivered to the U.S. Air Force in December 2001. The B61-4 Type 3E is the first loading and handling weapon trainer specifically designed to simulate the B61-3, -4, and -10. A total of 51 units were scheduled for delivery by March 2003. The new B61-4 Type 3E trainer includes the following features:[33]

- A Weapons Simulation Package (WSP), the internal brains of the trainer that simulates B61-3, -4, and -10 electric signals, including a monitor logic simulator, PAL system simulator assembly, new integrated circuit processor, new software, and new electric filters and regulators.
- A Preflight Control (PFC) system that allows PAL operations with the new Code Management System (CMS).
- New PAL capabilities that allow handlers and pilots to perform more preflight ground procedures and insert arming codes from the cockpit.
- Connectors, cables, plugs, seals, lugs, lid, housing assemblies, knobs, and switches precisely like those of a War Reserve B61 and that interface with the aircraft.
- Compatibility with F-15, F-16, F-111, and B-2 aircraft.

In 2002, the new trainers began arriving at U.S. air bases and NATO sites in Europe. A Sandia team also visited eight Air Force bases and NATO sites with a special suitcase-size version of the Type 3E trainer itself (its electronic form in compact form) and hooked the box up to actual aircraft.

Figure 8:
B61-4 Type 3E Trainer



A B61-4 Type 3E trainer assembly used by U.S. Air Force and NATO units in Europe to practice nuclear weapons maintenance and aircraft loading at air bases in six European countries. The U.S. Air Force began shipping the new trainers to Europe in December 2001.

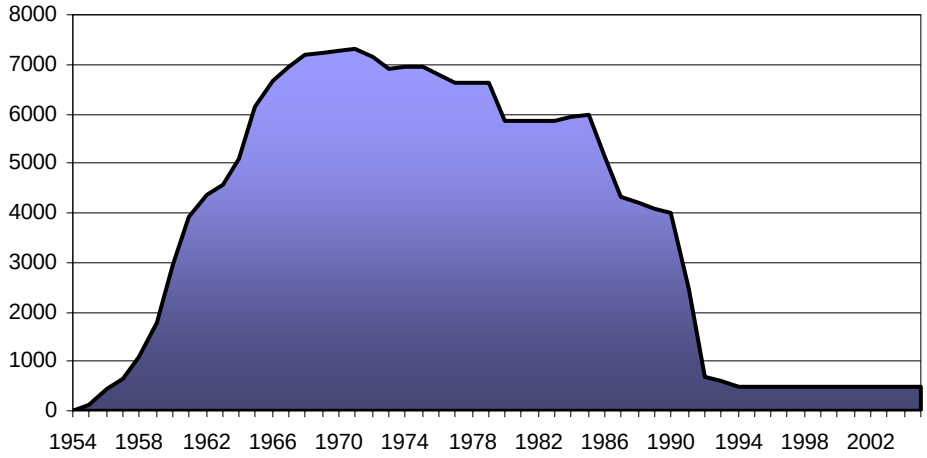
Source: Sandia National Laboratories

HISTORY OF U.S. NUCLEAR WEAPONS IN EUROPE

Political and Military Reasons For Deployment

The current deployment of nuclear weapons in Europe, and its justification, is the result of more than 50 years of nuclear policy. Much of the history of U.S. nuclear weapons deployments to Europe has recently become available thanks to diligent research based upon crucial documents released under the Freedom of Information Act (FOIA).[34] This information makes it possible, for the first time, to trace the numbers and kinds of the nuclear weapons deployed to Europe (see Table 8).

Table 8:
U.S. Nuclear Weapons in Europe, 1954–2005



The U.S. first deployed nuclear weapons to Europe in September 1954 when the first weapons arrived in Britain. Within 10 years, deployments spread to Germany, Italy, France, Turkey, the Netherlands, Greece, and Belgium, and in 1971 the deployment peaked with approximately 7,300 nuclear warheads deployed in Europe. After reaching a peak a gradual but steady decline ensued. While there continued to be many government statements about the importance and purpose of deploying nuclear weapons to Europe, the trend was clear: The stockpile would continue to decrease.

The beginning of the decline occurred between 1975 and 1980 when the arsenal was reduced by more than 1,000 warheads. This development coincided with a similar withdrawal of part of the U.S. arsenal of tactical nuclear weapons from Pacific Command after a review disclosed severe security concerns and numbers well in excess of war planning needs.

In several Pacific nations visited by a U.S. congressional delegation, American ambassadors professed that they did not know whether nuclear weapons were deployed in

the country or not. Several ambassadors pleaded ignorance about any understandings that may have been reached with the host country about the possible use of nuclear weapons.[35] Throughout the 1960s and early 1970s, more and more nuclear weapons had been added to the storage sites, eventually causing the Joint Chiefs of Staff (JCS) to become concerned about their physical security. In 1974, the JCS directed that the requirements for nuclear weapons deployment be reevaluated.[36]

Donald R. Cotter, the assistant to the Secretary of Defense (Atomic Energy), conducted an inspection of Commander in Chief, U.S. Pacific Command's (CINCPAC's) nuclear facilities in September 1974 and concluded that the number of nuclear weapons stored ashore in the Western Pacific were "well in excess" of requirements.[37] In response, Pacific Command said it preferred to reduce or phase out the ASW weapons, surface-to-air missiles, and the atomic demolition munitions while retaining bombs and surface-to-surface missiles.[38]

A prolonged congressional debate and a series of internal Pentagon reviews in 1973 and 1974 led to a conclusion that there were an excessive number of nuclear weapons in Europe as well. Secretary of Defense James Schlesinger directed the first major revision of its nuclear posture in Europe since they were initially deployed in 1954.

Schlesinger's views were partially influenced, according to one recent account, by the outbreak of war in July 1974 between two nuclear-equipped NATO countries, Turkey and Greece. Schlesinger wanted to know if the U.S. nuclear weapons were secure and asked his director of telecommunications and command and control systems, Thomas C. Reed, if he could talk to the U.S. officers holding the keys to the weapons. Reed reported back that the U.S. custodians were in charge, but at one Air Force base "things got a little dicier."

> "The local Army troops outside the fence wanted in. Their Air Force countrymen inside wanted them kept out. The nukes on alert aircraft were hastily returned to bunkers as the opposing commanders parleyed under a white flag. Soon both sides went off to dinner, but through it all we held out breath."[39]

Fears about the physical security of the weapons had been raised during the military coup d'état in Greece in 1967, where "political tension in the vicinity of some of our nuclear storage facilities" had caused concern in Washington.[40] As a result of the Turkish-Greek war, the United States removed its nuclear bombs from Greek and Turkish alert fighter-bombers and transferred the nuclear warheads from Greek Nike Hercules missile units (see Figure 9) in the field to storage. Greece saw this as another pro-Turkish move by NATO and responded by withdrawing its forces from NATO's military command structure. This forced Washington to contemplate whether to remove its nuclear weapons from Greece altogether, but in the end the Ford administration decided against it after the State Department warned that removal would further alienate the Greek government from NATO.[41]

Nothing was said about this nuclear dilemma in the final communiqué from NATO's Nuclear Planning Group (NPG) that met in December 1974. The group remarked it had "discussed the recent legislation in the United States calling for an examination of the doctrine for the tactical use of nuclear weapons and of NATO's nuclear posture…."[42] Other than that, the public was kept in the dark.

The Turkish and Greek episode and the discoveries at Pacific Command led to immediate improvements in the command and control of the forward-deployed nuclear weapons. A wave of terrorist attacks in Europe at the time added to the concerns. By the end of 1976, all U.S. tactical nuclear weapons were equipped with Permission Action Links (PALs). The June 1975 NPG meeting made a vague reference to this by stating that, "actions [were taken] to enhance the security of nuclear weapons stored in NATO Europe."[43]

The U.S. withdrew several older weapon systems and introduced several new ones, even proposing enhanced radiation warheads, or "neutron bombs," which proved too controversial. The NATO NPG meeting in January 1976 discussed "greater flexibility and more options" for the future posture,[44] achieved in part by assigning additional U.S. Poseidon ballistic missile submarines to NATO.

Figure 9:
Greek Nuclear-Capable Nike Hercules

During the 1974 Turkish-Greek war, the United States moved nuclear warheads from Greek Nike Hercules missiles into storage. Nuclear weapons remained in Greece until 2001.

Source: http://www.ed-thelen.org/overvu.html

By 1980, the stockpile was further reduced by more than 1,000 to about 5,800 warheads.[45] Additional reductions were delayed by concern over the Soviet deployment of SS-20 missiles, decisions to modernize Lance and artillery systems, as well as the dual-track NATO decision of December 1979 to deploy 464 ground-launched cruise missiles and 108 Pershing II ballistic missiles beginning in late 1983. These events

halted any further declines and even resulted in a slight increase of U.S. warheads in Europe, reaching nearly 6,000 in 1985.[46]

Public Uproar in mid-1980s Forces More Reductions

NATO's objective with the dual-track decision was to pressure the Soviet Union into negotiations to reduce or eliminate intermediate-range nuclear forces (INF). The capabilities of the new NATO weapons clearly caused concern in Moscow, but the public uproar surrounding the Euro-missiles significantly increased the pressure on NATO and the United States to reduce its nuclear arsenal in Europe.

The result was a curious one. On the one hand, NATO expressed its concern over the Soviet nuclear buildup in Eastern Europe and the western Soviet Union and decided to modernize its own nuclear forces. On the other hand, NATO acknowledged that that there were already more nuclear weapons in Europe than were needed. As the alliance struggled to resolve the conflicting positions internally, NATO continued to pressure the Soviet Union. In the midst of it all, the alliance suddenly decided in October 1983 to unilaterally withdraw an additional 1,400 tactical nuclear weapons in the so-called Montebello Decision.[47]

> "With the Alliance analysis now complete, the Nuclear Planning Group has decided on 27th October, 1983 to withdraw 1,400 warheads during the next several years. This Ministerial decision, taken together with the already accomplished withdrawal of 1,000 warheads, will bring to 2,400 the total number of warheads to be removed from Europe since 1979. Moreover, this reduction will not be affected by any deployment of Longer-Range INF (LRINF) since one warhead will be removed for each Pershing II or Ground-Launched Cruise Missile (GLCM) warhead deployed."[48]

The withdrawal of the warheads was planned to be completed by the end of 1988 and involved reductions of a variety of warhead types, including Atomic Demolition Munitions (ADMs). Once completed, NATO declared, "This sustained program of reductions will have reduced NATO's nuclear stockpile to the lowest level in over 20 years."[49]

One year before the Montebello withdrawal target date, the United States and Soviet Union signed an agreement in December 1987 to eliminate all land-based intermediate-range and shorter-range nuclear forces with ranges between 500 and 5,500 kilometers. The INF Treaty, as it became known, entered into force on June 1, 1988, with an elimination end date of June 1991. For NATO, this meant withdrawal and destruction of all Pershing IA, Pershing II, and GLCMs deployed to Europe since 1983 and all others in the United States as well. Not all of the 572 Pershing II and GLCMs ever made it to Europe, and so fewer than that were removed. Moreover, the Pershing IA was not part of the treaty but was covered by a side agreement between the United States and West Germany. Parallel with the INF withdrawal, NATO also continued ongoing retirement of Nike Hercules and older eight-inch artillery warheads.[50]

Coinciding with these reductions, the Pentagon in January 1990 announced the closure or realignment of nearly 80 military bases worldwide, including the two in Turkey where U.S. nuclear bombs were stored for use by the Turkish air force. The Munitions Support Squadrons (MUNSS) at Erhac/Malatya and Eskisehir were disbanded in mid 1991, but nuclear weapon storage continued at two other Turkish bases, Murted and Balikesir.[51]

At the NPG meeting in May 1990, NATO announced that the number of alliance nuclear weapons in Europe had been unilaterally reduced by more than one third since 1980,[52] from approximately 6,000 warheads in 1980 to nearly 4,000.

Rationale for U.S. Deployment in Europe Challenged by World Events

The ink was barely dry on the NPG statement before it was overwhelmed by a series of extraordinary events: the fall of the Berlin Wall and the dissolution of the Soviet Union. In June 1990, non-Soviet Warsaw Pact countries were formally removed from the U.S. strategic nuclear war plan (SIOP),[53] requiring adjustments to the theater strike plans for the tactical nuclear weapons in Europe. One year later, by the time of the INF deadline in June 1991, less than 2,500 U.S. nuclear weapons were left in Europe, 1,400 of which were air-delivered bombs.

The dramatic changes to the East called into question whether even 2,500 warheads were necessary. The allure of nuclear weapons in Europe had long faded, and as the NATO countries met in London in December 1990, they acknowledged that they now had to "go further." Additional reductions in the numbers and changes to the strategy were now possible. NATO envisioned a complete elimination of its nuclear artillery shells from Europe if the Soviet Union would do the same. The withdrawal of Soviet conventional forces from eastern Europe and the implementation of the CFE agreement meant that, "the Allies concerned can reduce their reliance on nuclear weapons." The NATO ministers ordered the development of a new military strategic concept of a modified flexible response strategy that made nuclear forces "truly weapons of last resort."[54] The ministers cautioned that the remaining weapons would continue "to fulfill an essential role in the overall strategy of the Alliance to prevent war by ensuring that there are no circumstances in which nuclear retaliation in response to military action might be discounted."[55]

Figure 10: Ground-Launched Cruise Missile

Some W84 warheads from the Ground-Launched Cruise Missile (GLCM) were planned to be stored in WS3 Weapons Storage Vaults (WSVs) on six air bases in Europe (see Appendix B). The requirement was removed by the INF Treaty. *Source: U.S. Army.*

The United States had an additional 17,000 nuclear weapons *outside* of Europe to deter the Soviet Union. So the London Declaration's suggestion that the remaining weapons deployed in Europe somehow made a difference seemed dubious at best. Yet the final communiqué from the NPG meeting in December 1990 portrayed a nuclear policy where the number of weapons may have declined but the basic purpose seemed essentially unchanged:

> "Our nuclear policy will continue to be based on fundamental principles which remain valid: nuclear weapons, strategic and sub-strategic, play a key role in the prevention of war and the maintenance of stability; European-based nuclear forces provide the necessary linkage to NATO's strategic forces; and widespread participation in nuclear roles and policy formulation demonstrates Alliance cohesion and the sharing of responsibilities, and makes an important contribution to our nuclear posture."[56]

It is curious but perhaps not surprising that at a time when NATO could have decided to eliminate all the nuclear weapons in Europe, the remaining weapons instead became reaffirmations of the basic value and importance of keeping them in Europe. The alliance's fundamental reason for existing – to defend NATO from the Soviet Union – had evaporated and stability was needed to carry on. Nuclear weapons, because of their special nature and history, provided a lure of stability and prestige, so NATO decided to keep the weapons. The decision to retain U.S. nuclear weapons in Europe also reaffirmed the principle that those weapons had to continue to be widely dispersed to half a dozen NATO countries to underscore alliance unity and burden-sharing. This need was emphasized in the final communiqué from the NPG in December 1990:

> "The remaining nuclear forces, for which we seek the lowest and most stable level commensurate with our security requirements, must be sufficiently flexible, effective, survivable, and broadly based if they are to make a credible contribution to NATO's overall strategy for the prevention of war."[57]

Obviously, none of this was actually the case. With the Warsaw Pact gone and a Soviet Union in internal disarray, a major war in Europe spearheaded by the Kremlin was the last thing NATO should worry about. Many new challenges faced Europe, including civil unrest in former Eastern Bloc countries, but nuclear weapons were utterly irrelevant in that struggle. In stark contrast to the lofty words from the NPG meeting, as the emerging war in Yugoslavia would demonstrate so vividly, the suggestion that forward-deployed U.S. nuclear weapons in Europe made a "credible contribution" to the prevention of war was nonsense.

The 1991 Gulf War Helps Create New Justification

Yet another war on NATO's periphery would, to some, soon strengthen the justification for maintaining U.S. nuclear weapons in Europe. The 1991 Gulf War and the subsequent

discovery of an advanced Iraqi nuclear weapons development effort raised the prospect that "rogue" nations might develop weapons of mass destruction (WMD) and threaten a European capital. Almost overnight, proliferation of weapons of mass destruction became a new rationale for maintaining U.S. tactical nuclear weapons in Europe.

Shortly before coalition forces initiated their attack to force Iraq out of Kuwait, NATO's NPG met in December 1990, but the final communiqué from the meeting did not mention WMD proliferation.[58] The war was to change all that. At its first meeting after the war, held in May 1991, the NPG stopped short of formally linking nuclear weapons in Europe to WMD proliferation in the Middle East. But the NPG did discuss "the potential risk posed by proliferation of ballistic missiles and weapons of mass destruction" and how to deal with them.[59] This linkage between proliferation and the nuclear posture would gradually deepen in the years to come.

At the time the Gulf War began on January 17, 1991, Iraq was known to have chemical weapons and ballistic missiles.[60] The Bush administration issued a formal threat, presumably nuclear retaliation, if Saddam Hussein used chemical or biological weapons, destroyed the Kuwaiti oil fields, or supported terrorists. At a January 9, 1991, meeting between Iraqi Foreign Minister Tariq Aziz and U.S. Secretary of State James Baker, the U.S. envoy handed Aziz a letter from President Bush warning that if

> "God forbid . . . chemical or biological weapons are used against our forces – the American people would demand revenge […]. This is not a threat but a pledge that if there is any use of such weapons, our objective would not be only the liberation of Kuwait, but also the toppling of the present regime."[61]

Baker did not mention nuclear weapons explicitly but he later explained in his memoir that he "purposely left the impression that the use of chemical or biological agents by Iraq would invite *tactical* nuclear retaliation."[62] Whether Aziz understood this as a nuclear threat is not clear. The letter made no distinction between the three unacceptable acts listed by Bush or how the United States viewed their importance. Because Iraq did not use chemical or biological weapons, some have since suggested that nuclear weapons played a valuable role in deterring their use. Baker concluded that: "We do not really know whether this was the reason" that Iraq did not use the weapons. "My own view" he went on to say, "is that the calculated ambiguity regarding how we might respond has to be part of the reason."[63]

But nuclear weapons did not influence Hussein's other types of behavior. In fact, Iraq did destroy Kuwait's oil fields and installations, one of the three actions on President Bush's list. Why the threat should have deterred the first action but not the third remains a puzzle. On balance, the alleged effect of nuclear weapons in deterring Iraq's behavior is dubious at best and is not conclusive. If anything, Saddam's constraints appear to have been more influenced by fear of regime change than by fear of nuclear attack.

Figure 11:
Protective Aircraft Shelter Logistics

In this satellite image of Ramstein Air Base, two C-130 cargo aircraft can be seen taxiing between Protective Aircraft Shelters (PAS). The C-130 is used to airlift nuclear weapons within the European theater, and the C-17 (top left) is used for transports to the United States. There are 90 PAS at Ramstein Air Base, 55 of which are equipped to store nuclear weapons.

Source: DigitalGlobe.

Besides, President Bush's nuclear threat was in fact a hollow one. Shortly before the Gulf War began, Bush decided that, "U.S. forces would not retaliate with chemical or nuclear weapons if the Iraqis attacked with chemical munitions."[64] The decision was disclosed in the *Washington Post* only two days prior to Baker's meeting with Aziz,[65] but it is not clear what impact the disclosure may have had, if any, on the Iraqi leadership's reading of the threat Baker conveyed to Aziz.

If President Bush ever considered the nuclear option, his decision not to use nuclear weapons may have been influenced by recommendations from the chairman of the Joint Chiefs of Staff General Colin Powell. Prior to the war, Powell ordered, at the request of Secretary of Defense Dick Cheney, a handful of Pentagon officials to work out nuclear strike options against Iraq. "The results unnerved me," Powell later confessed in *My American Journey*. "To do serious damage to just one armored division dispersed in the desert would require a considerable number of small tactical nuclear weapons…. If I had had any doubts before about the practicality of nukes in the field of battle, this report clinched them," Powell concluded.[66]

Defense Secretary Dick Cheney seemed less discouraged. In January 1991, as U.S. forces massed to liberate Kuwait, he issued a top-secret Nuclear Weapons Employment Policy (NUWEP), which reportedly tasked the military to plan for nuclear operations against nations developing or capable of delivering WMD.[67] Despite General Powell's belief, the Joint Military Net Assessment, published by his office in March 1991, concluded that no-strategic nuclear forces in particular "could assume a broader role globally in response to the proliferation of nuclear capability among Third World nations."[68]

New Cuts Lead to New Reaffirmation of Nuclear Role

On September 27, 1991, President George H.W. Bush announced that the United States would withdraw all tactical ground-launched and naval nuclear weapons worldwide. The initiative removed roughly 2,400 nuclear warheads from Europe but left behind about 1,400 air-delivered bombs in seven European countries.[69] NATO's public endorsement of the U.S. decision occurred in Taormina, Italy, where the NPG met on October 17 and 18 with the "principle objective" of agreeing to the new sub-strategic force posture and stockpile levels.[70]

With former targets in eastern Europe gone and the Soviet Union disintegrating, even 1,400 nuclear bombs seemed in excess of any real military need. The NPG therefore decided that in addition to the elimination of ground-launched systems, the number of air-delivered weapons in NATO's European stockpile would be cut by approximately 50 percent to about 700 bombs.[71] Altogether, the NPG declared, the total reduction in NATO's stockpile of sub-strategic weapons in Europe would be "roughly 80 percent."[72] Later, in 1999, NATO declared that the reduction in non-strategic nuclear weapons was "over 85 percent,"[73] and was completed in 1993.[74] As for the role of the remaining bombs, the 1991 NPG communiqué explained:

> "Nuclear weapons will continue for the foreseeable future to fulfill their essential role in the Alliance's overall strategy, since conventional forces alone cannot ensure war prevention. We will therefore continue to base effective and up-to-date sub-strategic nuclear forces in Europe, but they will consist solely of dual-capable aircraft, with continued widespread participation in nuclear roles and peacetime basing by Allies."[75]

This policy became embedded into the new Strategic Concept approved by the North Atlantic Council meeting in Rome in October 1991, which reiterated that "the presence of…U.S. nuclear forces in Europe remain vital to the security of Europe."[76] An article in *NATO's Sixteen Nations* further explained the thinking at the Rome Summit:

> "Nuclear forces, no longer even defined as 'weapons of last resort', are not considered relevant to immediate crisis management, but will be kept, much reduced, as the ultimate insurance against existing and possible new nuclear arsenals of other countries. Similar to conventional forces, the emphasis there is also on common involvement, by maintaining common allied planning and an allied potential, mainly in the form of dual-capable aircraft, with a strategic backup from three allied nuclear powers (United States, Britain, and France)."[77]

Neither the Strategic Concept nor the article in NATO's Sixteen Nations explained why this required maintaining U.S. nuclear weapons forward-deployed in Europe or why the thousands of other U.S., British, and French nuclear weapons couldn't have the same effect.

A secret document approved by NATO in late 1991, the 30-page MC-400, provided more details on NATO's strategy for nuclear and conventional forces in the post–Cold War era and provided military guidance for implementing the new strategy. Russia remained a main concern but weapons of mass destruction proliferation the Middle East received increased attention. NATO's nuclear arsenal was mainly a political weapon, MC-400 reiterated, but added that they could be used selectively to end a conflict by confronting an attacker with overwhelming costs if continuing the war. Nuclear weapons would be used especially on an initial strike, in a way that is "constrained, discriminate, and measured," the document said. Targets would include high-priority military targets, especially on an enemy's home territory, using either air-delivered nuclear bombs or missiles launched from ships and/or submarines.[78]

In response to the U.S. decision to remove ground-launched and naval nuclear weapons from Europe, the Soviet Union proposed that the remaining U.S. and Soviet nuclear bombs in Europe should be removed from all tactical air bases and stored at central locations away from the planes that would carry them. U.S. Defense Secretary Dick Cheney initially told reporters that he found "some merits" in the proposal, and a senior defense official told the *Washington Post* that NATO would study where the storage sites might be located and how much it would cost. But the proposal would require giving up the new Weapons Storage and Security System (WS3) NATO was building inside aircraft shelters at bases in Europe, and Cheney was concerned that storing the bombs in only one or a few sites would single out individual countries and make them vulnerable to criticism.[79]

Unfortunately, nothing came of the Soviet proposal. Instead, the NATO weapons were transferred from Weapons Storage Areas (WSA) to the new dispersed WS3 sites as these became operational during the 1990s. Once again, NATO used an opportunity for

change to instead reaffirm the importance of widely dispersed forward-deployed nuclear weapons to Europe's security. In doing so, it rejected the denuclearization of Europe. According to then NATO General Secretary Manfred Woerner:

> "Nuclear arms cannot be disinvented. We live in a world in which there remain many such weapons, and I cannot imagine situations in which Europe can be denuclearized."[80]

With a new numerical warhead level set, NATO moved and consolidated weapons at the various bases. For example, the 402nd Munitions Support Squadron (MUNSS) at Rimini in Italy was inactivated on August 1, 1993.[81] But the nuclear weapons were not returned to the United States but instead moved to the second Italian base at Ghedi Torre, increasing the number of B61 nuclear bombs to 40, stored in 11 vaults.

Figure 12:
Italian F-104 at Rimini Air Base

Italian F-104 fighter-bomber of the 6th Stormo Wing at Rimini Air Base. When the United States withdrew its Munitions Support Squadron in 1993, the nuclear weapons were moved to Ghedi Torre Air Base.
Source: Italian Air Force.

The Rimini inactivation followed the transfer of the 401st Fighter Wing from Torrejon Air Base in Spain to Aviano Air Base in May 1992. After arriving at the base, the wing began receiving nuclear weapons certification training. Interestingly, the nuclear mission interfered with the wing's conventional responsibilities in the Balkans, so USAFE asked for a 180-day waiver of the 18-month nuclear surety inspection interval for the 401st Wing. The burden of maintaining nuclear proficiency was considerable: Between January 1993 and March 1994, the 401st Wing conducted a total of seven local Nuclear Surety Inspection (NSI) exercises. Even amid the urgent non-nuclear requirements in post–Cold War Europe, the U.S. Air Force insisted that nuclear proficiency was so important that it turned down the request and granted only a 60-day waiver. In the next inspection in November 1994, however, only facilities would be inspected excluding all areas pertaining to aircrew performance and weapons loading.[82] Later, in April 1994, the 401st Fighter Wing was redesignated the 31st Fighter Wing.

Nuclear Reductions Trigger Security Problems

While NATO issued assurances about the safe storage of its nuclear weapons, the U.S. Air Force was urgently trying to correct deficiencies. In October 1992, General Merrill McPeak, the U.S. Air Force chief of staff, warned about the worsening practices regarding the safe handling and storage of nuclear weapons and directed commanders at every level to review surety programs to ensure that performance standards were rigorously maintained.

As a result, USAFE quadrupled the number of exercise Emergency Action Messages (EAMs) sent to the field and increased its Staff Assistance Visit (SAV) program, doubling the frequency of visits. Previously, teams visited nuclear units just prior to a NSI (every 18 months), but now the SAV would conduct several visits midway between the NSI approximately every nine months.[83]

USAFE evaluated the nuclear surety of 12 units in 1993, of which five were found to be "unsatisfactory." A MUNSS Tiger Team formed in December found that the problems were inadequate management and supervision. Specific deficiencies included:

- An unresponsive personnel assignment system
- A shortage of officers experienced in nuclear operations
- A lack of career command post professionals
- Inadequate training across the board[84]

NATO Tactical evaluations (Tac Evals), which were less stringent than the USAFE inspections, were also eroding. So poor was the erosion of USAFE flying support for Tac Evals during 1992 that General James Jamerson, U.S. Commander, Allied Forces Central Europe and Commander, USAFE, had to remind the numbered air forces that "requests for participation (Cold Igloo missions) remained one of the most visible indicators of U.S. support for NATO" and, therefore, were priority missions. Nevertheless, Tac Evals continued to be canceled in 1993 or postponed due to more urgent non-nuclear commitments, mission changes, and base closures. As a result, only two nuclear units received NATO evaluations during 1993 (36th Fighter Wing and the then 7501 MUNSS at Nörvenich Air Base).[85]

This decline in nuclear security appears to be an unintended side effect of the dramatic reductions in the number of nuclear weapons. The number of nuclear-capable units in the U.S. military dwindled as well, and with long-term job security looking a bit shaky the MUNSS positions were difficult to fill. Security police especially found it difficult to get officers and NCOs with nuclear training and experience. Maintenance units faced the same problem. Most people had experience with missiles, while fewer and fewer had experience with nuclear gravity bombs.[86]

Personnel security was another serious problem. Some newly assigned people arrived at the MUNSS units before receiving their security clearance. The U.S. Air Force later found that several individuals could not be certified under the Personal Reliability Program (PRP). At remote sites with one-year rotation such as Turkey or Greece, personnel might be certified less than half of their assigned time, or not at all, the U.S. Air Force found.[87]

The single greatest cause of MUNSS failure, the U.S. Air Force determined, was inexperience and incomplete training of personnel. Maintenance officers were not getting the required nuclear courses following their aircraft maintenance officers' course, and new nuclear technicians were not familiar with the procedures for the B61 bomb. Personnel with responsibility for receiving and processing Emergency Action Messages

(EAMs) in the command posts were also arriving untrained, and USAFE emergency action trainers were not prepared to train them. Overall, too many inexperienced officers and enlisted personnel were being assigned to the MUNSS, with no quality check by USAFE headquarters, the numbered air forces, or MUNSS commanders. Even the commanders were a problem. A majority of MUNSS commanders were newly appointed with no prior experience at that command level,[88] even though their job was to guard and employ the ultimate weapons.

The U.S. Air Force implemented new procedures and committed new resources in an attempt to fix the problem. Between April and November 1994, for example, the wing readiness and inspection division of the 31st Wing at Aviano Air Base in Italy conducted no less than 11 Limited Nuclear Surety Inspections (LNSIs).[89] Inspection scores in 1995 showed some improvement, but the declining pool of nuclear trained personnel continued to be a problem. The reduced manning made it difficult to keep inspection visits on track. The schedule at the time called for main operating bases (Aviano, Lakenheath, Ramstein, Incirlik) and standard tour MUNSS sites (Kleine Brogel, Volkel, Büchel, Nörvenich, Memmingen, Ghedi Torre) to be visited annually, with semiannual visits to the three short-tour (one-year rotation) MUNSS sites in Turkey (Akinci and Balikesir) and Greece (Araxos).[90]

Another attempt to improve nuclear surety involved NATO's oversight of nuclear certifications of USAFE units in support of the alliance. NATO periodically conducts TAC EVALs of USAFE nuclear-capable units, but up until 1998 there was no procedure in place for NATO to monitor their readiness and capability to carry out their nuclear mission. To correct this deficiency, Supreme Headquarters Allied Powers Europe (SHAPE) in March 1998 requested that the U.S. Air Force release executive summaries to NATO officials of all nuclear evaluations of units tasked to provide Dual-Capable Aircraft (DCA) support to NATO.

Air Combat Command (ACC) complied with the request, and the first opportunity to provide the information came after a combined Nuclear Surety Inspection (NSI), Phase II Operational Readiness Inspection (ORI), and Fighter Nuclear Procedures Inspection (FNPI) for the 4th Fighter Wing (FW) at Seymour Johnson Air Force Base in North Carolina in May 1998. This was also the first such nuclear readiness evaluation of that unit, which assessed the ability of the wing to carry out its assigned mission, including deploying F-15Es to Europe. ACC later reported that NATO officials at SHAPE were pleased with the results.[91]

Another change implemented by NATO was to replace the NATO Alert System with the Nuclear Precautionary System (NPS), which occurred in October 1994. The NPS directed that the nuclear strike aircraft would be under much tighter political control than previously. At the same time, NPS also eased the Soviet-focused nuclear command and control architecture and provided a more flexible system that could support strikes against regional aggressors armed with weapons of mass destruction.[92]

See Part 2